

Thomson (W. H.)

ORIGINAL LECTURE ON THE
SIGNIFICANCE OF COUGH

WITH REFERENCE TO TREATMENT

—BY—

DR. W. H. THOMSON,

NEW YORK.

Professor of Materia Medica and Therapeutics, University Medical College, N. Y.,
Physician to Bellevue and Roosevelt Hospitals, Etc., Etc.

Read before the New York County Medical Society, December, 1888.

Published by the *New England Medical Monthly*, March 15, 1889.

DANBURY, CONN.:
DANBURY MEDICAL PRINTING COMPANY.
1894.



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In this climate there is scarcely anything for which a physician is so often asked to prescribe as a cough. Not only is it something distressing to have, but to many persons it is such an ominous thing to bear, that its prompt removal is earnestly sought as if otherwise it is a note of death. There is much to justify this dread and practically physicians are obliged very soon to stock themselves with a list of prescriptions for cough. I doubt also whether any other kind of prescriptions are so little varied after some years experience as each one's cough mixtures. They become almost as routine and habitual to the doctor as any adult habit and are very apt to last for life. Before falling into such practice, however, it is worth while to study this symptom by itself, for when its very diverse origin in different cases is thereby revealed, then not only its varying significance according to its origin becomes plain, but the practical deduction follows that its proper treatment should be anything but a matter of routine. Moreover a brief inspection of the cough remedies which are usually classed in our text book under the term expectorants, should suffice to indicate that often they cannot relieve this symptom in the same fashion, for among so called expectorants we find included medicines which lessen the excitement that leads to cough and others which are supposed to stimulate it, some are given to promote secretion and others to diminish it, others again to alter it or others to disinfect it. Therefore it follows upon this, that we cannot judge the merits of any agent recommended for this respiratory disorder without a preliminary recognition of the different causes or conditions which occasion cough.

We would begin by defining cough as a reflex act, whose single motor or efferent mechanism is called into play by a great variety of efferent impressions. Its one proper object is expectoration, but much oftener than any other reflex act of the body it occurs without its object, and is therefore useless, so that one of the commonest indications for the physician is to suppress useless cough and to allow only that which will accomplish its natural purpose.

To support this statement I will now proceed to enumerate various kinds of useless or non-expectorant coughs, none of which subserve any good purpose and which therefore we should aim directly to arrest. My list includes no less than fourteen kinds which are more or less common, and doubtless gentlemen present can add to their number. Before describing them, however, I would draw attention to an important fact in my opinion, namely, that all non-expectorant coughs have one marked feature in common which will always serve to distinguish them from the cough which serves a good purpose, namely, the true expectorant cough. That distinctive character of all useless coughs is to be found in their sound, which is specifically different from the sound of any expectorant cough whatever. The sound of a non-expectorant cough, whatever its kind or origin, is always single, while an expectorant cough is never so. That is to say, the non-expectorant cough, no matter how constantly or rapidly repeated, consists in a series of separate acts, and hence may be likened to the separate blows of a hammer. They may be few or many, very loud or just audible, occurring only just now and then or in quick succession, either for a brief period or in prolonged paroxysms, enough to prevent all rest or sleep and yet each cough is as distinctly independent of the other as the strokes of a hammer are, whether they be few or many. * * *

This continuous character of an expectorant cough is well illustrated in cases of chronic bronchitis with very viscid expectoration, the catarrh sec. of Laennes. The particle of mucus may be only a small globular, but sticky mass, and yet once started on its way the patient has to devote his whole efforts in a succession of quick powerful coughs which it is impossible for him to check until he gets rid at last of a seemingly insignificant quantity for such a great and tumultuous effort. I once knew such a case in an old man who was the terror of some ladies in church, for when he began, he soon entered upon a run of rapid little squeaks, which with his swaying body and blackening face suggested some fearful catastrophe, until a final sort of hallelujah in his throat told the hearers that the phlegm had arrived.

With these preliminary observations we now pass on to the different varieties of non-expectorant cough; the first we would mention is due to simple inflammatory irritation without secretion of some portion, or the whole, of the respiratory tract from the epiglottis down to the third division of the bronchi. A typical instance of this is to be found in the purely hyperæmic stage of acute bronchitis when, with a tumefied and dry state of the bronchial mucous membrane, we find the patient much oppressed for breathing and constantly tormented with a frequent short and hacking cough, each act of coughing evidently increasing his sense of soreness and tightness of the chest. The prevailing sound of his cough I need not say is of the non-expectorant variety, while auscultation reveals a number of dry whistling rales often more pronounced on expiration. The indication here is to turn the cough as soon as possible into the expectorant variety by nauseant expectorants which will start secretion. For this purpose I use a grain of tartar emetic dissolved in a teacup of water and direct the patient to take a teaspoonful every ten minutes until he begins to feel a little sick. When he does so the dyspnoea usually vanishes, easy expectoration comes on and the separate husky coughs stop.

A much more common example of this cough, however, occurs in the course of ordinary bronchitis, both acute and chronic, where, owing to the fact of the co-existence of secretion and more or less free expectoration, its presence may be overlooked and it be confounded with the expectorant cough. In these cases the patients have a number of distressing and painful separate hacks without bringing up anything, their cough, however, every now and then terminating in the continuous expectorating kind. In all such cases, though there may be considerable secretion yet it is unequally distributed in patches of viscid coating with inflamed spaces between, and particularly if the dry surfaces are about the bifurcation of the bronchi. We need not say that these cases of mixed expectorant and non-expectorant coughs are especially frequent in the course of phthisis, as we then have ulcerated conditions in the track of decomposed pus expelled from vomicae or from pouches of dilated bronchi. I am particular, therefore, to listen to the patient's coughing in order to determine the ratio between the expectorant and the non-expectorant sounds, and if there be a considerable number of the latter, to add the sedative neurotics to the cough mixture. Of these I most prefer a small dose of chloral with a small dose of morphia, than a full dose of either separately with the addition of aconite in febrile cases. Eight grains of chloral and one-eighth of a grain of morphia, for an adult, are quite sufficient.

But what we would particularly desire to emphasize at this juncture is that these neurotics are to be given for the non-expectorant element in the cough, exclusively. So far as expectoration itself is concerned, they are drawbacks and not helps. I have seen, therefore, much harm from the routine use of neurotics in coughs given apparently because, in some cases they are so markedly beneficial. In the passive bronchorrhœa of the aged with dilated hearts, in chronic bronchitis with bronchiectasis and emphysema, in capillary bronchitis, in pneumonia, and lastly, in all conditions in which there is abundant secretion, they are not only useless, but may be quite mischievous, and, as before remarked, they have no place in a cough mixture unless the sound of the cough betrays much useless irritation, as a complication.

The second variety of useless cough which we would mention is pure inflammatory irritation of the pharynx. This is common enough in ordinary colds and not frequently the precursor of laryngeal tracheitis by extension. It is, however, one of the most obstinate troubles of advanced phthisis, giving rise to a constant tickling sensation in the throat which has been wrongly ascribed to reflex irritation from ulcerated surfaces lower down. Kohts found that a few separate coughs could be induced by electrical or mechanical irritation of the posterior surfaces of the palate and uvula and also of the pharynx, and that most violent and prolonged paroxysms could be induced by pulling the pharyngeal nerve. These facts explain the use of throat demulcents, and for the same distress in phthisis I have found Sidney Ringer's recommendation to apply a powder of one grain of morphia to five of starch, with a brush, low down in the throat, often enables patients to get a night's rest from the arrest of the prolonged paroxysms of coughs, which otherwise would rarely stop until vomiting changed temporarily the sensation of the throat.

The third variety of useless coughs is from irritation of the pleura. The importance of recognizing the pleuritic origin or element in a cough can scarcely be overrated. I believe that many cases of permanent damage to the lungs, including the induction of phthisis itself, might often be prevented if the frequent origin of a chronic cough in a pleuritic adhesion was more commonly recognized. A valuable monograph might be written, indeed, on the theme that "Serous Inflammations are Always Serious," not so much from their immediate effects, though often that is the case, as from the far-reaching consequences on the affected viscera of the glueing together of the two surfaces of their serous coverings. How long, for example, will it be that the brain or spinal cord will be as good as ever, after a meningitis, however slight? When will the heart be quite free from the effects of a pericarditis? How often do we find the sequelae of a long antecedent peritonitis manifest themselves in some complication in the abdominal cavity? But post mortem revelations show us that of all serous inflammations, those which lead to pulmonary adhesion are the most common, often where they had not been at all suspected. Repeatedly, on the other hand, I have found that patients who come to me with a chronic cough, some with the diagnosis of chronic fibroid phthisis, others as cases of chronic bronchitis, and others as instances of constitutional irritability of the respiratory passages, others again as asthmatics, have proved on examination to be suffering from chronic pleuritic adhesions, and therefore were most benefited by measures directed to that condition. Nothnagel, it is true, failed, he says, to induce cough by irritation of the pleura, but other experimenters, and especially Kohts, found the case to be directly the reverse; the latter observer noting it as invariable if the irritation was sufficient to cause inflammation. I am sure, however, that all clinicians will testify to the prolonged tendency to short hacking cough, after a patient has recovered from any attack of severe pleurisy. I myself have never found it absent in any such patients that have been under my observations for a year after their attack. The only exceptions, which in truth are only apparent exceptions, are in cases of hydrothorax with renal disease, for in them the effusion is often too watery to leave adhesions after absorption. These patients are specially prone to have their cough return with changes of the weather, a common source of aggravation of all symptoms due to adhesions of serous membranes, as in pachymeningitis, for example, but, because their cough returns, then they are apt to ascribe it to their catching a fresh cold. My rule, therefore, is to strap the whole affected side for six months or more after every attack of general pleurisy, explaining to the patients the necessity of the procedure to allow of as perfect rest as possible to this unresting respiratory surface, as otherwise the embers of the original inflammation will not go out and a permanent source of pulmonary mischief remain. The immediate relief to the constant sense of uneasiness in the side, and the cessation of the useless ominous hacking cough which accompanies that uneasiness, very soon reconcile the patient to the trouble of wearing the straps. There are, however, many other conditions besides simple pleurisy where these considerations will apply.

Whenever patients come to me with the ordinary signs of phthisis, I ask if they have been troubled with rheumatic pains about the shoulders. The answer is frequently in the affirmative, with often a pain behind the scapula worse in stormy weather. These pains are sure to give rise to useless cough. It is the familiar dry hacking cough of early phthisis. As a means of diagnosis, laying the cold hand on the infra clavicular space over the affected part will immediately elicit several sharp hacks, when the same procedure tried first on the unaffected side will not do so. But a still more decided example of this kind of cough, and with much more injurious effects, is when a womica has contracted extensive adhesions in front. The patients often then complain of an acute incisive pain through the lung which constantly excites more coughing. Now in both the early stages, and still more in vomical, this pleuritic cough cannot be otherwise than harmful and provocative of increased inflammation in the surrounding parts. When, therefore, the phthisical process is limited to one lung, I invariably strap that side and keep it so for months together. Some writers, on theoretical grounds, object to this procedure. I believe that if they took careful clinical notes of the cases in which strapping is tried, they would come to a very different conclusion.

The fourth variety of useless cough is the spasmodic cough of pertussis. This cough is specific in its kind and not due to bronchitis. It may, therefore, be wholly suppressed in less than a week, as I have done repeatedly, and not return, though the disease remains and runs its natural course, and may remain as infectious as ever without there being any cough present. If, however, the patient contract a cold before the six weeks is over, the whooping cough at once comes back and then is quite intractable to the measures which at first arrested it, showing that the irritation of simple bronchitis plays the same role in inciting the nervous irritability of pertussis that bronchitis does in exciting asthma. My plan for arresting the cough of pertussis is to bring the patient as rapidly as possible fully under the influence of belladonna. Nothing short of doses which will produce the physiological effects of the drug should be tried. In children the dose should be enough to produce flushing of the skin, and repeated every two or three hours, night and day, for a week, after which the intervals of the doses may be gradually lengthened. Five grains of chloral may be added if after the third day the belladonna does not seem to have the full desired effect.

The fifth variety is a tracheo laryngeal cough in children, occurring mostly at night and due to malarial infection. It is quite paroxysmal and strongly suggestive of whooping cough. In one family I had a younger child begin with such pronounced symptoms that I was fearful that it was true croup. The next day, however, three more of the children were down with the same croupy cough and each with considerable fever. The occurrence of so many cases of croupy cough together was a great relief to me, for I soon found my suspicions confirmed as to the nature of the trouble by a sign on which I place a good deal of reliance as diagnostic of a malarial infection in children, namely, the presence of blood corpuscles in the urine under the microscope. Children with these malarial coughs often rise in the morning tired and fretful with no appetite, with brownish yellow coating of the tongue and considerable pharyngeal redness; but during the day they scarcely cough at all. If a few blood corpuscles are found in the urine, a few doses of quinine are sufficient to arrest the cough.

The sixth variety is familiar to physicians as the nocturnal cough of children from some irritation in the alimentary canal, such as from indigestion, the presence of worms, etc., and should be treated accordingly.

The seventh variety is that with which we are all familiar and which is often termed the uterine cough. If it be meant by this that it is associated with disorder of the female generative functions or organs it is correct enough, but the starting point of the irritation may not be from the uterus, but rather from some of its accessories. This cough is often the loudest of all coughs, as in some hysterical women. Like

other accompaniments of hysteria, I have succeeded best in its treatment with purgatives like cascara, aloes and rhubarb, with intestinal antiseptics like benzoate of soda, salol and camphor, with the usual adjuvants of myrrh, assafoetida and valerian, and the bromides. On the other hand in women more advanced in life we may find a local cause in the cervix uteri, the removal of which may be all that is necessary. The cough of chlorotics which so often excites alarm as likely to be from phthisis, is doubtless of the same general character.

Very different, of course, is the next variety, namely, the aneurismal cough. The diagnosis may be facilitated by listening carefully over the trachea to the persistent croupy sound of the breathing, no matter how quiet the respiration be. I have suspected aneurism in a case of laryngeal phthisis, by this sign, where the co-existence of pronounced laryngeal ulceration made the case otherwise very obscure, and the autopsy proved the correctness of the surmise. This cough is best relieved by morphia, but it is surprising how often its most distressing paroxysms can be warded off by a couple of leeches to the notch of the sternum.

Similar in its genesis but of widely different import, is the cough produced by enlarged bronchial glands pressing upon the pneumogastric. This may be one of the earliest signs of phthisis, but if so it wholly differs in its nature and associations from the early pleuritic cough. It is almost invariably accompanied by excessive sensitiveness of the pharynx. Very often this goes along with hoarseness or even aphonia and intractable vomiting, although there be no vomica or scarcely any pulmonary symptom present. At other times there is a good deal of palpitation of the heart. In these cases the normal bronchial breathing between the scapulae is much intensified. You can promise the patients that their hoarseness and vomiting will both cease after a while, which it usually does with softening of the implicated glands, but all the symptoms, including the cough, can meanwhile be greatly relieved by repeated dry cupping between the shoulders. I have wondered whether some of the good results reported from the old practice of a seton between the shoulders in the treatment of consumption may not have happened in cases of this kind. Of course this kind of vomiting with hoarseness in phthisis is wholly different from the same symptoms later on.

Another example of purely reflex coughs is mentioned in all our text books on diseases of the ear. Foreign bodies in the external auditory canal are specially prone to occasion it, and if we cannot find the reason for paroxysm of apparently causeless coughing we had better look for plugs of hardened wax as a possible explanation.

Finally we have the coughs of mitral insufficiency and of cardiac dilatation, which are too familiar for us to detain the society with. Also the cough from irritation of the phrenic nerve in perihepatitis, and even in abscess of the liver, as well as in some case of splenitis, each of which is to be recognized by its sound as having nothing to do with expectoration of matter from the lungs, each also requiring its own and not a routine treatment. There remains one cough, however, which is always of grave import, namely, the cerebral cough. In a few cases of epilepsy it may indicate nothing but a functional irritation, but when associated with symptoms of cerebral mischief it points to organic changes or irritative lesions affecting the cough center in the medulla oblongata. This is apparently located in the rhomboid groove on both sides of the raphe, just above the calamus scriptorius, and is particularly apt to be excited by affections of the under surface of the cerebellum, or by effusion, abscesses or tumors pressing the cerebellum down upon the medulla.

I have spent much time in referring to these various kinds of simple irritative coughs, because they are all of a wholly different nature from the cough which is due to the presence of some material that is not in its proper place when it is in one of our air tubes. Where that material is a foreign body, no matter how small, it must leave. But just the same may, if it be a secretion of fluid in an air tube; the tube is not for fluid and it must leave also. Hence a continuous and imperative coughing in which each act enforces the preceding, is set up until the clearing out is accomplished. The

indications therefore for the treatment of expectorant coughs are simple and there are only two. First to make the phlegm so liquid that it will flow easily, and secondly to make the coughing powerful enough to be effective. We may add a third, which, however, is not so much concerned with the act of expectoration itself, namely to check or diminish the amount of superabundant secretion. The last indication occurs especially in the passive bronchorrhœa of old persons, in cardiac weakness, and in most cases of chronic bronchitis with emphysema. For many such cases of chronic bronchitis I have found no treatment better than the *Tr. Ferri. Mur.* to tone the heart and weaken the bronchial muscles, because iron—the oxygen bearers, particular remedial effect, lies in its increasing muscular power. Along with this action, we may seek the adjuvants. *Tr. Nucis Vomiceæ*, *Digitalis*, Citrate of Caffiene and Sweet Spirits of Nitre. In other cases, as in phthisis with profuse bronchial discharge, the dilute nitric acid is indicated to check secretion, and at times, I have had in these, very good effect from three grain doses of zinc oxide.

There is one condition however, in which expectorant power is often imperatively needed, and that is in the capillary bronchitis or pneumonia of young children or infants. Here we may have recourse to one of those physiological associations in the actions of contiguous organs, which it seems to me ought to be more frequently noticed in our text books than I find to be the case. Thus reasoning upon the fact that we can hardly have a movement of the bowels without a simultaneous emptying of the bladder and moreover that the act of defecation itself seems to excite a freer flow of the kidneys, as shown by one or more attempts to pass a little more water after the bladder had been previously emptied along with a movement of the bowels. I have had repeated large enemata of warm water given in the treatment of the suppression of scarlatinal nephritis for their physiological diuretic effect, and not, as some say, to have them act as internal warm water fomentations to the inflamed kidneys. But an equally close association exists between the esophagus and the respiratory tract. Prof. Kroenkecker has shown that each act of swallowing produces a distinct stimulant effect upon the heart, as well as upon the mechanism of expiration, and hence in the severe dyspnoea of children's pneumonia, I have kept for prolonged periods the little patients swallowing half teaspoonful doses of hot milk and lime water with the best results in aiding their failing power of expectoration. On the same principle I recommend the sipping of a cup of hot coffee for phthisical patients before they rise in the morning to facilitate their morning expectoration.

There remains therefore for us to consider now the treatment of true expectorant coughs according to the indication often presented, namely to render the bronchial secretion less viscid and more easy of expulsion. Prior to the year 1875, I relied on the drugs ordinarily recommended in our works on the *materia medica*, and used mixtures of ipecacuanha, squills, senega, chloride of ammonium, chloride of potash, or balsamic mixtures with opium, etc. Although I had my share of successes with these agents, yet I was constantly meeting with cases of cough, especially with chronic ones, which did not progress to my liking at all. An instance of this sort induced me to try a new departure. A lady aged forty-five consulted me about a chronic bronchitis of many years' standing, which in a few weeks after winter set in would be complicated with distressing asthma. Expectoration was very profuse and viscid. She would then be confined to her room the whole of the winter and spring months, and often be unable to rise from her chair without inducing a paroxysm of asthma. Orthopnoea was constant during the night, and ere long after I had begun treatment, her urine became scanty and general anasarca set in. One of the features of this case, also was a persistent sore throat, mainly due to a posterior pharyngitis, which often caused aphonia and from the irritability of the parts, vomiting during her fits of coughing.

Having for some time interested myself in the observation of the action of oils when administered internally on mucous secretions, I came to the conclusion that all oils that are taken up in any quantity from the intestine, whatever their other properties might be, would pretty surely produce a watery flow into the bronchial tract, es-

pecially if directed to that mucous surface by a local hyperæmia. I had already found by experience as I thought that a castor oil purgative on that account acted badly in infants with bronchitis by increasing the flow into the bronchi of mere watery secretion and thus intensifying the natural difficulty of expectoration in their little patients. On the other hand, it struck me that as much of the benefits of the domestic remedy of flaxseed infusion in acute bronchitis might be due to the oil in the seeds, the linseed oil itself might answer the indication I had in view in this patient, if a proper emulsion of it could be made. I found however at first a considerable difficulty in making a stable emulsion at all of this oil, still more a palatable one, but after repeated trials, I succeeded in getting one made which is quite equal to any of the cod liver oil emulsions in the market and an improved formula for which I herewith append. On administering it to my patient the beneficial effect was ere long very noticeable. In the course of a week the expectoration became much easier, and in less than a fortnight the asthmatic attacks and the pharyngeal injection and irritability were markedly lessened. The treatment with the oil was steadily persevered in with such continuous improvement that she was able to resume her domestic duties some two months in advance of her usual date of improvement, but what is more to the purpose, she has remained ever since almost wholly free from her old disease, as she is soon able to prevent its development whenever the symptoms manifest themselves, by an immediate recourse to the remedy. Since 1875, the emulsion of linseed oil has been my constant prescription in ordinary acute bronchitis, almost to the exclusion of other medicines, because I have found none so prompt or efficacious as it is. As I have made a uniform practice for many years to keep notes of all the cases of my private practice, I can speak quite definitely on the subject and support my statements not by memory but by record. It is because I feel that we have in this oil a most efficient remedy for expectorant coughs, that I would urge it upon the attention of the profession.

In order to allay the element or nervous irritability caused by the inflammatory condition of the bronchial mucous membrane, I commonly add to each tablespoon of the emulsion, six to eight grains of chloral and from 1-10 to 1-8 of a grain of morphia; but I need not say that the benefits of the mixture can scarcely be largely due to this for such small doses of these neurotics would soon show their efficiency if administered singly, while they have no effect whatever on the quality of the sputa. Not only, however, do I rely on this emulsion in acute bronchitis, but still more in the most chronic forms of the disease when the expectoration is viscid and adhesive. As a prophylactic against ephysema, I regard it as invaluable, and deem it not impossible that it may serve as a direct nutrient of the pulmonary tissue, for I have often noticed after its prolonged administration for many months, a decided improvement in expiratory powers on the part of patients who seemed at first to have considerable overdistension of the lungs. It is well a remedy of decided value in the treatment of bronchitis, as distinction from peptic, asthma, as well as in the asthmas which have a history of sequence to pertussis or measles.

Another frequent indication for its administration is in the treatment of a phthisis in patients who cannot take cod liver oil, particularly in those who have much bronchitis. Of course it can hardly claim to possess the nutrient properties of cod liver oil, but as a substitute for it where such has to be found, I find it much superior to cream or other proposed substitutes. In many cases that can take cod liver oil, but in whom the cough is very racking, I administered it temporarily until the cough is relieved by a change in the character of the expectoration, and I may say that but few who after a few days' trial find themselves unable to continue in, for in my experience, in comparison with cod liver oil, it is much easier borne by the stomach. * * *

But as remarked above, when the bronchitis is primary and local in its etiology, the indication for its use comes up as soon as we have a cough which would at once improve if only we could change the secretion from the tough, glutinous, clear, albuminous coating which lines the tubes in acute bronchitis, or the small, adhesive, yellowish pellicle which causes such severe coughing in chronic bronchial catarrh, to the secretion which the patients themselves will easily describe as loose and easy.

A RELIABLE REMEDY.

By F. T. JENKINS, M. D., WASHINGTON, D. C.

When the physicians of all countries, particularly those of America, are deluged with samples of preparations by manufacturing chemists, for which, astonishing results are claimed. The shelves of druggists are groaning beneath the weight, not only of many injurious proprietary "remedies" and "curables" but stacked up to the ceilings do we find the many compounds, each one claiming from the doctor his especial attention and promising effects, never, yet, heretofore obtained. Among these preparations do we find the many emulsions, mostly of cod liver oil, and it would seem that a *raison d'eter* be demanded for the defense of still another emulsion, were it not so essentially different from any of its predecessors.

I am constrained to offer to you the facts as I have found them, in the trial and use of what I believe ought to be one of the greatest aids the medical profession has ever yet had in the treatment of diseases of the respiratory organs. I refer to the compound emulsion of linseed oil, known as *Linonine*, prepared by the Danbury Pharmacal Company, at Danbury, Conn.

So deeply have I been impressed with the results obtained not only by personal use of the emulsion but from close observation of trials made by other physicians, that I shall, in giving my reasons for my preference for *Linonine* over all its competitors, go somewhat into detail as to its entire formulæ and will state some facts for the benefit of others, to whom in these busy times a little light is always welcome—some of whom may still be clinging to cod liver oil or its many poor disguises.

Flaxseed from time immemorial has been used for coughs and colds by the nicest of old women. Teas and demulcent drinks being greatly depended upon as a domestic remedy—and by the medical profession the commercial oil has long been used, locally and occasionally for internal administration—when one of the more far-seeing of the medical profession noting that secretion was promoted in the bronchial tract by the oil of the seeds, called attention to his observations* and endeavored from time to time to secure an emulsion that would answer his purpose, but extemporaneous preparations of an emulsion of linseed oil compound, even though accompanied by the prayers and exhortations to the druggists, proving as unstable and unsatisfactory as efforts *ex tempore* usually do—when some clever New England chemist solved the problem—secured a plant and gave to the medical world an oil made from the Bombay seeds by cold compression, with the required manipulation for cleansing of all impurities and added ingredients, more excellent than those yet before seen—in short a perfect emulsion was evolved—mathematically precise in every detail.

Linseed oil as we find it in *Linonine*, to begin with, is palatable, easily assimilated and quick in action—promotes secretion rapidly—ridding the bronchi of the tenacious mucous so characteristic of acute bronchitis, completely changing the character of the inflammation, rehabilitation following—and all without the use of such depressing agencies as ipecacuanha, squills, senega, tartar emetics, etc., etc., *ad infinitum*, *ad nauseam*. In chronic bronchitis the same results obtain. No trouble to the stomach, no trouble to the digestive organs, all of the oil taken up, not a globule left in the excreta—and with cessation of the disease, repair so rapidly supplied that waste has disappeared. As a builder, then *Linonine* has no equal—a bold assertion, but I can make it good—both from argument and from clinical experience.

The Irish moss which forms a basis for the emulsion known as *chondrus crispus*, carrageen, etc.—a growth upon the searocks, a direct nutrient and demulcent containing starch, fatty matter, *iodine and bromine*. Among the many chemists finding iodine

*In a paper read before the New York Academy of Medicine on "Cough; Its Significance and Cure," by Wm. H. Thomson, A. M., M. D., Professor of Materia Medica and Therapeutics in the Medical Department of the University of New York, December, 1883.

and bromine I need only name Dupasquier, (I think the French name given to the moss more nearly correct than any other, *mousse marine pertee*—which at once signifies from whence the moss comes) directly showing that iodine of necessity is one of its main constituents, for which alone, cod liver oil has claimed to contain value. It would be a work of supererogation for me to show why cod liver oil has proved so unsatisfactory to both physician and patient; so much of the animal oil being passed through the alimentary canal undigested, yet quite enough remaining to give the pancreatic digestion more work than it can attend to, causing the different phases of indigestion and the consequent depression to the nerve centres, until we find the patient's last state worse than the first.

Eucalyptus, the next ingredient, is invaluable, acting directly as it does on the inflamed mucous surfaces, relaxing spasm, etc. The hydrocyanic acid having especial action on the larynx or bronchi, quieting cough, even palliative of the cough of phthisis—and of other affections of the chest with dyspnoea, affording greatest relief, as combined, in asthma, whooping cough, etc.

I find it impossible to give the results of my observation of Linonine, without calling to the minds of those who may read this article, the salient points of each ingredient entering into the make of this compound emulsion of linseed oil, which is doing such wonderful work wherever it is used as indicated, and I would beg to remind my brethren of one more fact. The sugar, the little used in process of making the emulsion and what is evolved from the starchy matter during digestion, from the carrageen and marsh-mallow, the influence of which, by its extraordinary osmotic power, infusoria and other low forms of life, to which fermentative processes are ascribed are almost instantly destroyed, the organisms collapsing through the rapid exosmose of its fluids into a medium partly saccharine. In conclusion I would say that while every case I have seen Linonine used in, where indicated, there has been a most happy result, I have also had the good fortune to be the means of prolonging a life which chronic bronchitis was soon to terminate, that although the age of the patient, Mrs. H., æt. 92, was of course hard to overcome, yet Linonine *cleared up* the bronchial tract and this leaves her free to choose some other method of exit.

A PRACTICAL SUBSTITUTE FOR COD LIVER OIL.

BY G. H. PIERCE, M. D., DANBURY, CONN.

Since 1889 *Linseed Oil in Emulsion* has been in constant use in my practice. I had found great difficulty in getting many of my patients to take cod liver oil in any form, and when linseed oil in a palatable form was brought to my notice, it required but a few trials to establish its merits.

The preparation known as *Linonine* is a perfected emulsion, and superior to the *Mistura Ol. Lini* at first presented to the profession.

The writer was probably one of the first physicians of Danbury to make extensive use of the linseed oil emulsion, and did so alone on the merits of the preparation.

Cod liver oil is of course invaluable if the stomach will tolerate it, but there are so many complaints from eructations that it has to be abandoned, often when the system positively demands an oil food. *Linonine* is borne by a weak stomach, and any after-taste which may arise is only that of the flavoring matter, which is not at all objectionable. The oil is so finely divided in the process of emulsification, and the other ingredients so thoroughly mixed that nothing except a pleasant taste is noticed.

Linonine is indicated in all cases where cod liver oil would otherwise be used, and in some cases where the latter would not be. We would not think of prescribing cod liver oil in acute bronchitis; *Linonine*, the linseed oil emulsion, is most useful in this affection, for combining the anodynes and sedatives, morphia and chloral, where pain and great inflammatory conditions exist, a perfect remedy is produced. No severer tests of the worth of a pulmonary medicament could be found than those presented by

the various forms and stages of La Grippe. During the first outbreak of this disease in the winter of 1893, so I prescribed linseed oil *ad libitum*, with and without diluent and mucilage, according to the degree of acute inflammation and amount of coughing, and obtained the very best results from its use. The very tight closing in the bronchial tubes (swollen and inflamed) in the very first stage of bronchitis, and in the last stages the secretions are favorably modified.

Formerly linseed oil was used only as a vehicle, or care for pain, or applied externally in cases of burns. The hindrance to internal use was owing to its disagreeable taste, which has now been most beautifully overcome. *Zenarine*. It must be remembered is more than a simple oil—it is a compound pharmaceutical product—containing, in addition to the oil, of hypophosphite of iron, oil of gaultheria, Irish moss, marsh-mallow, glycerine and dilute hydrocyanic acid.

In a case which I have at present of annoying cough, there being a tendency to vomit at each paroxysm of coughing, which has necessarily left the stomach in a delicately receptive condition, I prescribed *Zenarine*, and the patient at once recovered on the palatableness of the preparation. Now, it is an oil emulsion, and is not disagreeable to a delicate stomach.

How few, with such a combination of stomach and cough, could tolerate a cod liver oil emulsion at such a time. In ninety-nine cases out of a hundred the returning taste of the fish oil would set the patient against it. Not so with the linseed oil. There is no taste to return to disgust the palate, and the oil is so thoroughly emulsified, and at so tempting a flavor, that the patient anticipates the next dose with a relish. Indeed it is more difficult to keep one from "drowning" the entire contents of the bottle than to get him to consent to take in moderation the prescribed dose. The doctor is receiving daily, literature and samples "useful in the treatment of La Grippe," the food is a profitable one, and every remedy is the best. From my experience with *Zenarine*, denoting as it does nutritive, alterative and sedative properties, I am satisfied that its efficiency will not be long in being universally proven.

TO THE MEDICAL PROFESSION.

In calling your attention to *Zenarine* or pharmaceutical preparation, we believe that we are doing you a favor, for if we are able to convince you that we have a preparation which cures a series of cases which are so well reached by no other known remedy with the same ease, made and introduced in the most ethical manner, your patient will be benefited and you served. It is well known that physicians are disappointed in the use of cod liver oil, in cases where it is indicated, on account of its non-assimilation and the difficulty of digestion. As a fact we know that there are thousands of physicians throughout the country to-day, who have given up the use of this most valuable oil because of these facts. In linseed oil, (if properly prepared by the cold process and from selected seeds) we have an excellent substitute and one which never disagrees with the stomach. This is no new preparation but one that has been used by the medical profession for over seven years, *always* with satisfactory results. It is manufactured in the form of an emulsion, which is as *pleasant to take as sweet cream*, and is *undiluted*. Combined with *Glucose*, *Eucyptus* C. P., *Chauliurus* (selected), *Athusa*, *Officialis* (selected), *Asylum Hydrocyanic* and dil. C. P., *Glycerine* C. P., *Oilum Gaultheria* C. P., we have a mixture which is of the most curative value, in *coughs, bronchitis, whooping-cough, phthisis, asthma, and all of those coughs in which the expectoration is difficult, from the tenacious character of the sputa.*

As a *nutrient*, a *moistener* and a *laxative* it is *equal to, if not more efficacious than* cod liver oil, *even when that can be taken and digested.*

Zenarine is prepared with the greatest care, by skilled pharmaceutical chemists. The oil is expressed by a special process from the seeds imported from Bombay.

These seeds, by a series of elaborate experiments, we have found to be the best adapted for this purpose, because they contain less mineral substances, and more of the oil, while the oil is of greater density than that found in the seeds of other places, containing more muric acid (of great therapeutic value) as well as dextrogyrate, gum, sugar and cellulose.

The oil, as we have said, is made by a special process and subsequently freed from all extraneous, deleterious, or unnecessary substances. In the large experience which physicians have had with Linonine, never have we heard of one instance, where it has not been easily borne by the stomach, and in a number of instances where the faeces have been watched for weeks at a time, has a single undigested globule of oil been seen. This alone is a point of great therapeutic value to the doctor. Its power of thinning the secretions of the lungs is probably its most wonderful action. Take a given case, where the sputa is thick, tenacious, and exhausts the vitality of the patient, in the exhausting efforts at coughing, the administration of Linonine will produce results which are almost magical in their quickness. In the after effects of *La Grippe*, especially in those cases where the influenza has been complicated with pneumonia, leaving a bad cough, do we find that it has proved a most valuable remedy. It builds up the body while it cures the cough.

The following editorial from *The Prescription*, Feb., 1892, shows the tendency in this direction:

"To most physicians linseed oil is good for the purpose of making carron oil only, and its subsequent application to burned surfaces. But it has other and valuable therapeutic uses which we believe are not fully understood. It is as valuable as cod liver oil in the treatment of all of those diseases for which the latter is used, while at the same time it does not in the least disturb the stomach. It is a vegetable oil and is as easily digested as cream, if properly prepared. Taken in the form of an emulsion it is readily assimilated by the stomach, and its influence on the mucous membrane of the bronchi are of a healing character. In phthisis it has been used with great advantage, and in all of the chronic coughs it is simply invaluable. It is also a laxative and is indicated in the treatment of hemorrhoids. We are sure that if used more freely by the profession, it will prove of great value in their hands, as it has in the hands of the comparatively few doctors who have tried it."

A FEW OBSERVATIONS.

Of course every new combination of medicines is subject to a considerable amount of criticism from the general practitioner, who looks only at the formula and indications for its use, without basing his remarks upon clinical experience.

In *Linonine* we have, we believe, one of the most valuable therapeutic measures which has ever been presented to the medical profession. It is no new preparation, but has been in use for the last seven or eight years, and the best evidence we can present to an unbiased observer is, the array of local medical talent who, in this little pamphlet, have given their unsolicited testimonials to its value. If the home doctors endorse it, use it and appreciate it sufficiently to say so over their own signatures, that ought to be pretty good evidence that the manufacturers are honorable men, and their product valuable and just what they represent it to be.

While Dr. Thomson was the first to call the attention of the profession to the use of oleum lini, and first presented a working formula of an emulsion to the profession, and while this formula was previously the basis of *Linonine*, still to-day, *Linonine* is as unlike Dr. Thomson's formula, as possibly can be.

In the first place, Dr. Thomson's formula would keep only a certain length of time; while *Linonine* keeps indefinitely and in any climate.

It contains besides, 30 per cent. more of the oil which is made by a special process, freed from all impurities, and from selected imported seeds.

Oil of eucalyptus is also added. The great difficulty previously to the use of this valuable oil has been its irritating properties when taken internally, though no one remedy in the materia medica is so useful in the treatment of cough as that of eucalyptus. We use only the purest oil of eucalyptus, and by a special process, obtained only after a long series of experiments, we have succeeded in combining it in such a manner as to do away with all of these objectionable features.

Marsh-mallow is also added, to make the emulsion more even and stable, as well as for the starchy matter which it contains, which is more easily assimilated by the stomach, and has wonderful sustaining powers.

The quantity of glycerine used in *Linonine* is nearly double, while the syrup has been decreased in order to eliminate that objectionable feature, too much sugar for the stomach of the invalid, which sooner or later rebels, especially if taken for a long time.

That it is a builder par excellence, superior to cod liver oil, and "the perfect substitute for cod liver oil," can only be proven to the skeptic, *by a careful clinical trial*. Any physician who doubts this statement we are sure we can convince in a practical way, by communicating with us. Instances are on record where seven pounds have been gained in two weeks, and in the practice of one of the physicians of Danbury, who stands high in his profession, a patient, Mrs. C., recovering from an attack of pneumonia following the grip, gained on the use of *Linonine*, (tablespoonful four times a day,) eleven pounds inside of two weeks. We will be glad to put any physician in correspondence with the doctor in regard to this case.

The clinical experience of all who have tried it has been to go to prove that *Linonine* (Emulsio Lini Comp.) is a builder far beyond the idea of those who have not used it.

The oil should be of the purest character, cold pressed and made from selected seeds.

METHODS OF ADMINISTRATIONS.

The dose of *Linonine* is one tablespoonful three or four times a day, after meals and at bedtime.

If there is much irritability caused by the inflamed condition of the bronchial mucous membrane, from six to eight grains of hydrat. of chloral may be added and from 1-10 to 1-8 of a grain of morphiæ, as the indications may require. The following formula will serve: \mathcal{R} *Linonine*, $\frac{3}{4}$ vj, Chloral Hydrat., $\frac{3}{4}$ iss, Morphia Sulph., gr. iss.

M. Sig. Tablespoonful an hour after meals, and if the coughing is severe at night, a fourth dose may be given at bedtime.

OPINIONS OF THOSE WHO HAVE USED "LINONINE."

"An extended and entirely satisfactory experience with *Linonine* proves conclusively to my mind that it is a reconstructive without a peer. Its acceptability, palatability and digestibility are important factors toward this end."

W. S. Watson, M. D.,
Surgeon 4th Reg. Conn. Nat. Guards; Vice-President Fairfield County Medical Society; Visiting Physician to the Danbury Hospital, etc., etc.

Dr. W. C. Wile, of Danbury, Conn., in speaking of *Linonine* says: "I have used *Linonine* very extensively in my practice for the last four years, and I find it unequalled in the Cough of Phthisis, as well as in Acute and Chronic Bronchitis. In the after effects of *La Grippe*, especially those cases which have been complicated with Bronchitis and Pneumonia, I have noticed the very best results. Palatable, easily assimilated, and quick in action, I consider it a *sine qua non*."

Danbury, Conn., Jan. 6, 1892.

The Danbury Pharmacal Company.

Gentlemen:—I have used *Linonine* with very good results in bronchitis, and I find it an excellent remedy after *La Grippe*. I cheerfully indorse it in all cases where the system needs building up.

Respectfully, W. H. Murray, M. D.

The Danbury Pharmacal Company.

Gentlemen:—During the last four years I have used frequently, Linonine, and have found it of great service in the different forms of cough, notably those coughs not attended with much expectoration, and the dry cough of Phthisis. It is an elegant emulsion and easy of administration.

Yours truly, E. M. Smith, M. D.

Danbury, Conn., Jan. 2, 1892.

The Danbury Pharmacal Company.

Dear Sirs:—I have used your "Linonine" with good results, and find it to fill the bill. It is much more pleasant to take than Cod Liver Oil, or any of the emulsions which are on the market, and equally valuable.

Very respectfully, Wm. J. Burke, M. D.

Danbury, Conn., Jan. 11, 1892.

The Danbury Pharmacal Company.

Gentlemen:—Your Linonine has proven to me a faithful and reliable substitute for Cod Liver Oil. Being quickly digested, and easily borne by the weak or nauseous stomach. Practically sure in the convalescence of *La Grippe* where hawking and dry cough is a torturing sequel.

Respectfully yours, Samuel J. Kelly, M. D., M. C.

Brookfield Centre, Conn., Feb. 1, 1892.

The Danbury Pharmacal Company.

Gentlemen:—Having used your excellent preparation (Linonine) for some time past in my private practice, I wish to express to you my appreciation of its merit. I find it especially applicable in that class of cases suffering from lowered vitality, consequent upon many forms of wasting pulmonary diseases attended with dry hacking cough, diminished expectoration, etc., etc. Being palatable and easily taken care of by the stomach, it should stand high with the profession as a perfect substitute for Cod Liver Oil.

Very truly, J. F. Smith, M. D.

Boston, Mass., Feb. 5, 1892.

The Danbury Pharmacal Company.

Gentlemen:—Your Linonine has proven to me a faithful and reliable substitute for Cod Liver Oil. I have used it in my practice for about eight months, and in each and every case it has done its work quickly and surely. Gentlemen, I cannot speak too highly of it. I should have said something for it before, but I do not intend to give my word of honor until I am sure of what I am doing.

If this little recommendation will be of any use to you, why use it as you please, for I will always speak well for the bridge that carries me safely over.

Respectfully yours, W. H. Farnsworth, M. D.

Danbury, Conn., Feb. 6, 1892.

The Danbury Pharmacal Company.

Gentlemen:—I have used your Linonine and am very much pleased with its action. I find that not only is it an excellent substitute for Cod Liver Oil in phthisis and wasting diseases, but that in the former it also allays the irritating cough and promotes expectoration.

Yours respectfully, N. Selleck, M. D.

Danbury, Conn., Feb. 5, 1892.

The Danbury Pharmacal Company.

Gentlemen:—Having used your product, "Linonine," as a substitute for Cod Liver Oil, I find it all that is claimed for it, viz., a perfect substitute for Cod Liver Oil, while not being in the least obnoxious to the most sensitive stomach.

Yours sincerely, S. Willard Oley, M. D.

Danbury, Conn., Feb. 10, 1892.

The Danbury Pharmacal Company.

Gentlemen:—Allow me to say that I most heartily endorse your preparation "Linonine." I believe it to be a most sterling remedy in the treatment of the various wasting diseases, especially those pertaining to the pulmonary organs. I find it a most pleasant and active agent in the building up of patients recovering from the *La Grippe*, and in the allaying of the irritable cough attending such convalescence, its results are most excellent.

Respectfully, G. E. Lemmer, M. D.

Georgetown, Conn., Feb. 10, 1892.

The Danbury Pharmacal Company.

Gentlemen:—I have used your emulsion of Linseed Oil for the past six years, both in hospital and private practice.

Your Linonine I have used this year in convalescence from *La Grippe*, especially in cases which have been complicated with pneumonia or acute bronchitis, and have received excellent results. It is certainly a very pleasant emulsion, and is retained by the most sensitive stomach.

Yours truly, R. W. Lowe, M. D.

The Danbury Pharmacal Company.

Gentlemen:—I have had most satisfactory results from the use of Linonine in cases of Diphtheria, using it as a substitute for other nourishments.

Danbury, Conn., Feb. 12, 1892.
Very truly yours, W. A. Barnum, M. D.

The Danbury Pharmacal Company.

Gentlemen:—I received your sample bottle of "Linonine," and after a fair trial I feel willing to recommend it in all wasting diseases where Cod Liver Oil is indicated.

Edinburgh, Ill., April 4, 1892.
Yours truly, B. Greenwood, M. D.

The Danbury Pharmacal Company.

Gentlemen:—I have been using Linonine somewhat extensively of late, and am much pleased with it. I think in many instances it is preferable to Cod Liver Oil, especially in subacute cases.

Danbury, Conn., April 12, 1892.
Yours very truly, H. F. Brownlee, M. D.

The Danbury Pharmacal Company.

Sirs:—Having used Linonine in a number of cases, I am well pleased with it, particularly in a case where I have tried different preparations of Cod Liver Oil, and none could be tolerated by the weak stomach. Now the patient is taking the Linonine three times daily, with very good results.

Bethel, Conn., April 14, 1892.
Yours, A. E. Barber, M. D.

The Danbury Pharmacal Company.

Gentlemen:—I have used *Linonine* in cases requiring a restorative, with gratifying results. It has given satisfaction in every instance.

Ridgefield, Conn., April 15, 1892.
W. E. Weed, M. D.

The Danbury Pharmacal Company.

Dear Sirs:—I received a sample bottle of Linonine from you in January. Its use proved satisfactory to me, and I have used several bottles with increasing satisfaction. I have prescribed it frequently for coughs, and am convinced that it has great merit.

Ridgefield, Conn., April 15, 1892.
Respectfully, W. S. Todd, M. D.

The Danbury Pharmacal Company.

Gentlemen:—I have used Linonine in three cases where Cod Liver Oil could not be retained by the stomach, and have found it answers all the purposes of Cod Liver Oil.

Danbury, Conn., April 19, 1892.
Dr. William F. Lacey.

Having been requested by several professional friends to try Linonine as a substitute for the different preparations of Cod Liver Oil, I have found it to be much more easily assimilated in the average case of phthisis than any of the Cod Liver Oil emulsions, and it is certainly more palatable. I am glad that my attention has been called to it.

St. Louis, May 3, 1892.
Wm. Porter, M. D.,
Prof. of Diseases of Throat and Chest, St. Louis College of Physicians and Surgeons.

The Danbury Pharmacal Company.

Gentlemen:—A sample bottle of Linonine ordered from you some time ago, fills the bill exactly with a patient who cannot use Cod Liver Oil in any shape. I saw your advertisement in *The Prescription* and ordered the sample especially for this case, it seems to act like a charm. My patient says "it fills a long felt want" in his case. I am so favorably impressed with the results after using one bottle that I asked my druggist (W. H. Styer, Marietta, O.) to order it for me.

Whipple, Ohio, June 7, 1892.
Address, J. M. Hardy, M. D.

The Danbury Pharmacal Company.

Gentlemen:—After an extensive use of Linonine I find it is retained by the stomach better than Cod Liver Oil in any form, and it always regulates the bowels after they have been locked up by opiates and sedative cough mixtures.

I was particularly pleased with it in a case of marasmus, the result of gastric catarrh and ulceration, where all other treatment had failed. I am,

Pleasant Valley, Dutchess Co., N. Y., July 14, 1892.
Very respectfully yours, I. D. Le Roy, M. D.

DANBURY, Conn., Oct. 1, 1894.

The Danbury Pharmacal Company.

Gentlemen:—We take pleasure in saying that we have sold over twelve gross *Linonine* since January 20, 1892, to this date (2 years and 5 months).

The most of this has been prescribed by the Danbury physicians in bronchial troubles and as a builder (in preference to cod liver oil). We also have sold it to customers who could not take cod liver oil, with the best of results. We think you can refer to any physician in Danbury.

Very truly yours, REED & COMPANY.

SWEET SPRINGS, Mo., Sept. 25, 1893.

The Danbury Pharmacal Company.

Gentlemen:—More than one month ago I was taken with severe bronchitis and after trying the usual medicines with but little benefit, I concluded to try *Linonine*, and it has cured me, and be assured I entertain a very high opinion of it. I have not taken quite one bottle full. Shall keep it on hand.

D. J. PARSONS, M. D.

NEW YORK CITY, Jan. 22, 1894.

The Danbury Pharmacal Company.

Gentlemen:—I have been troubled with a lingering grip for weeks, and the benefit from one bottle of *Linonine* is so pronounced that I am inclined to keep three or four bottles at hand for family use.

A. HENRI HART, M. D., 151 E. 52d Street.

KINGSTON, N. Y., Sept. 3, 1892.

The Danbury Pharmacal Company.

Gentlemen:—I have used your emulsion of linseed oil, "*Linonine*," quite extensively, and the results obtained have been both quick and satisfactory. I would advise its use particularly in chronic catarrhal troubles. I am very respectfully yours,

J. CHAMBERS, M. D.

DANBURY, Conn., Sept. 10, 1892.

The Danbury Pharmacal Company.

Gentlemen:—I have prescribed *Linonine* for the last year or two in bronchitis, with satisfaction to my patients, consequently to myself. In cases of low nervous troubles its use is attended with very satisfactory results. Shall certainly continue its use as long as these results are obtained. Yours truly

EMERSON E. SNOW, M. D.

Finally.—We feel quite confident that all physicians who try *Linonine* in the various diseases for which it has been recommended in the preceding pages, will find that it will fill a long-felt want in their practice. No greater authority in the United States exists to-day than Prof. William H. Thomson, and the testimonials added to his make a most convincing argument in its favor. To recapitulate: It is readily borne by the most delicate stomach; it is palatable, the youngest child taking it with avidity; it does what no other medicine can or will do, and that is, loosen the tough, tenacious mucus so distressing in all or nearly all forms of chronic cough. It will keep in any climate, while it is a builder superior to cod liver oil.

Send for sample.

THE DANBURY PHARMACAL COMPANY,

Danbury, Conn., U. S. A.